ACROSS THE CARIBBEAN BY AIR

The Story of Army Aviators' Nonstop Flight From Miami to Panama

By MAJ. JACOB E. FICKEL
U. S. Army Air Corps

The following is the story of the nonstop flight from the United States to Panama recently completed by three Army flyers, who returned to Wright Field Mar. 19. The flight was made by Maj. Jacob E. Fickel, executive officer of the materiel division, author of the narrative here presented; Lt. Albert F. Hegenberger, co-pilot on the first flight from California to Hawaii, and Lt. Ennis Whitehead, a pilot of the South American Good-will Flight of 1927. The three, together with Sgt. K. D. Wilson, who served as radio operator, crossed without a stop from Miami, Fla., to France Field, Panama Canal Zone, via the Caribbean Sea.

WE LEFT Wright Field on Feb. 14 in a new Ford transport equipped with three Wright J-6, 300-horsepower, air-cooled engines, flying by way of Maxwell Field, Montgomery, Ala., and Birmingham to Tampa, Fla. At Tampa, late on the night of Feb. 18, we received orders to ferry the new transport we were flying to Panama and to bring back an older Fokker transport, equipped with three 220-horsepower J-5 engines.

On the morning of Feb. 19 we took off for Miami, Fla., from which point we would leave for the Canal Zone. We arrived in Miami the same morning and spent the rest of the day in preparing the plane for the long hop, checking and swinging the compasses, looking over the drift indicators and other instruments, and "gassing." We fed 720 gallons of gasoline into the tanks. The distance by way of the Caribbean Sea was approximately 1,140 miles. We were carrying enough gasoline for 15 hours of flight, although we hoped to make it in 11 hours if there was no wind. We remained at the Pan American Airways Field working on the plane until midnight.

Assistance Given

The Pan American organization gave us every possible assistance, turning men and equipment over to us. Their efficiency was everywhere apparent and aided in our getting ready for take-off in the shortest possible time. The Weather Bureau provided us with special weather reports from Miami to France Field, and indications were that we would have favorable winds the entire way on the twentieth. Although we had remained at the field until midnight, we were back again at 3:30 a. m. on the twentieth and making the last preparations for leaving. As the first streaks of dawn appeared, 6:10 a. m., we took to the air. There were in the plane Lts. Hegenberger and Whitehead, co-pilot; Sgt. Wilson, radio operator, and myself, acting as navigator. Albert Jarvis, of the Wright Aeronautical Corporation, who had flown with us from Wright Field, followed us to Panama by boat.

Once out over the water, we discovered we had a strong wind on the port bow, causing a drift of 17 degrees and cutting down the ground speed from 105 miles per hour, which we had hoped to make, to 82 miles per hour. This caused us little concern except that of landing in darkness should we be delayed to that extent.

Flew Over Cuba

We flew directly over Cuba, setting our course from Cienfuegas to the Cayman Islands. These islands, which lie 200 miles south of Cuba, are possessions of Great Britain, and we had been instructed not to fly over them. We skirted them beyond the three-mile limit, then set our course for the Seranilla Bank, some 400 miles to the south. We hit the Seranilla Bank directly on the course, and reset our direction for Serrana Bank. The next check was Roncador Bank. These are small banks in the sea not large enough to be called islands. They would be utterly inadequate for the landing of a plane. All told us that we were directly on the course.

We then set the compass for the entrance to the Panama Canal, but struck Fort Sherman, just three miles away. The course lay along the 80th Meridian approximately all the way. We landed at France Field, Panama, at 5:30 p. m., making the time of the flight 11 hours and 20 minutes for the 1,140 miles. This averaged a little better than 100 miles per hour. During the flight we were in constant radio communication with Miami until noon and had interrupted communication with Panama during the afternoon. Our arrival was a great surprise to the personnel of France Field, for they had not known we were on our way. We received, nevertheless, a very hearty welcome.

At France Field

We remained in France Field until Feb. 26 while the plane in which we were to return was being conditioned. This flight was to lie over Central America and Mexico to the United States. Our first leg was to Managua, and we spent the night there with the Marine flyers who were on duty at that point. The next day we proceeded to Guatemala City, where we remained over a day to have the engines checked. On Mar. 1 we left, expecting to make Tapachula, Vera Cruz and Brownsville by nightfall. We landed at Tapachula for gasoline, but on take-off we had engine trouble of such serious nature that we decided to wire the United States for a mechanic and some spare parts. Lt. Ames S. Albro flew down from Duncan Field, bringing Mr. Finster, a mechanic. Work was started and the plane was in readiness by Mar. 8. A trial flight was made. But in landing, a strong gust of wind caused the plane to ground loop into a tree stump, and although there was no injury to any of the passengers, it was damaged beyond repair.

That made it necessary for us to find another way of getting home. The Mexican government immediately, at the order of the president, sent Col. Pablo Sidar and another pilot with two planes to fly us back to the United States. Col. Sidar is to Mexico what Lindbergh is to the United States, so that this unsolicited service was a great compliment to the people of the United States, as well as to the stranded flyers. Col. Sidar took us to Mexico City, where the government extended every courtesy possible, the secretary of war receiving us in audience. We remained in Mexico City for two days, then were flown by Col. Sidar to Laredo, Tex., where we caught busses and trains for Dayton.

The flight from Miami to Panama without stop proved the possibility of direct communication with the Canal Zone in the shortest possible time. It was the first time such a flight had been accomplished in a multi-motored plane, and only once before had it been accomplished by any type plane whatever. As a military maneuver it held considerable importance. Plane and engine functioned perfectly, so the flight was without particular incident. We struck two rain squalls and dodged a third; otherwise the weather was perfect.

Navigation Not Hard

The difficulties of navigation with the instruments we carried were not great. Three magnetic compasses and one induction compass were installed. A bubble sextant enabled us to learn our position from astronomical observations, if necessary. Drift indicators were carried to be used in connection with smoke bombs to get the wind direction and ground speed. An interesting item of radio equipment was a small battery-operated transmitter set, to be used as part of the equipment of the rubber life raft. In the event of an emergency landing in the sea, the life raft would have been inflated by carbon dioxide supplied at high pressure from special containers, the small radio set with a range of approximately 300 miles being employed to establish communication with steamships in the vicinity. The life raft also was equipped with emergency rations and water bags against a forced landing in the sea. Our noon meal on the flight consisted of coffee and sandwiches.

A Scenic Return

The trip back lay over magnificent scenery. We had the contrast of mountain peaks, with many smoking volcanoes, and dense tropical jungles. The Mexican people in Tapachula we found exceedingly gracious in their treatment of us. Everything possible was done to make our stay interesting and comfortable and to facilitate our return home. The army commander, Gen. Mendez, was especially helpful. Col. Sidar, detailed by the president to fly us to the United States, is an extremely capable pilot, and he showed the utmost consideration and courtesy toward us. The Pan American Airways, whose line runs through Tapachula, also offered us transportation back to the United States, and their kindness was taken advantage of by Sgt. Wilson, whom they carried to Brownsville, Tex.

We found airplane travel in Mexico surprisingly advanced. The country is criss-crossed by airlines operating on schedule. The airplane is especially valuable there because of the poor means of ground travel. Railroads are not numerous, and many of the important cities have no railroads whatever. For instance, three cities of from 5,000 to 30,000 inhabitants in the interior of the State of Chiapas have no means of transportation except mule train, horseback, and in the dry season automobiles. The journey from these towns to Tapachula, which is a railroad center, requires from five to eight days in the dry season, and from three weeks to two months in the wet season. There are now two airplanes to these cities each week day from Tapachula, the time required for making the trip being one hour. The flight from Tapachula to Laredo, Tex., took approximately 11 hours of air travel. The same trip by train requires seven days. South of Mexico City, on the great Mexican plateau, is a surprisingly dense population and every acre of arable land is under cultivation. The mountains surrounding Mexico City are under cultivation up to 10,000 and 11,000 feet and the whole countryside is dotted with villages.

The flight from start to finish was both delightful and enlightening, not only in the long-distance training received and the contacts with an almost unknown people, but also from the point of view of testing special navigation equipment and the successful military experiment of delivering a long-range type of reconnaissance airplane to an airdrome stationed in the Canal Zone in the shortest possible time.

THE MARKET IN CHINA FOR U. S. PLANES

THE increasing importance of China as an outlet for American aircraft is evidenced in recent export figures, according to a statement made orally Mar. 29, by Leighton W. Rogers, chief of the aeronautics trade division, Department of Commerce. During January, Mr. Rogers pointed out, China was the purchaser of three aircraft at a cost of $90,000, and bought engines valued at $37,400.

Adapted to Country

Aviation is especially adapted to the needs of that country, Mr. Rogers said, in that although its area is 1,900,000 square miles, there are about 410 miles of macadam roads, and 17,336 miles of unimproved roads. There are 8,750 miles of railroads and 65,000 miles of canal. This lack of transportation facilities coupled with the hilly and mountainous nature of a great portion of the country, point to aviation as a partial solution for the communication and transportation problems of China.

Although there is a lack of flying fields, there are many military fields and civil airports under construction at Hankow and Nanking, he said. However, the airports have not been greatly developed, most of them being merely cleared plots of ground.

There are two distinct climatic seasons, Summer and Winter, with short Springs and Autumns, Mr. Rogers explained. The Summer temperature in the Peiping region averages 100 degrees Fahrenheit while the Winter temperatures average four degrees Fahrenheit, while Summer and Winter in the Shanghai region averages 98 and 15 degrees Fahrenheit, with considerable humidity.

American amphibian planes with American pilots are used on a line giving daily service between Shanghai-Nanking-Kuikiang-Hankow, a distance of 620 miles for air mail, passengers and express, he pointed out. The ministry of communications operates a line from Shanghai to Nanking, using American single-engine cabin planes with American pilots, but this service is likely to be switched to cover other cities. There are no official aeronautic missions in China and representatives from companies in all nations have been there interesting government officials in equipment and services. Companies of Germany, Italy and France have been active with pilots and planes demonstrating equipment. A United States manufacturer sent two men to China in 1929 to investigate the possibility of sales and the establishment of air lines which resulted in a contract and the establishment of an air line.

There are at present no aircraft manufacturing establishments in China, according to Mr. Rogers, and there is not much possibility that there will be any aeronautic manufacturing for some time to come. There are no flying schools or clubs other than those operated by the national and provincial governments.

Total of Importations

A total of 125 aircraft was imported into China in 1929, of which 34 were American, 38 German, 35 British and 18 French. The approximate value of the total of these imports was $1,230,000, of which American companies received $267,500, it was brought out. Commitments on American airplanes and equipment in the amount of $452,000 have been made for 1930. All aeronautic activity is associated with the military and landing facilities are under the control of the ministry of war, Mr. Rogers said. All imports of aircraft must have the permission of this ministry.

REVISED SCHEDULES

SPRING service on all European air routes was begun simultaneously, Mar. 1, 1930. Previous to this year the various companies have made their seasonal alterations of service on different dates. In accordance with a decision taken at an international conference held recently at Berlin by representatives of 22 companies changes in operations will be made on the following basis: Mar. 1 to Apr. 30, Spring or half-season service; May 1 to Aug. 31, Summer service; Sept. 1 to Oct. 31, Autumn or half-season service; Nov. 1 to Feb. 28, Winter service. (W. L. Finger, automotive trade commissioner to Europe, Paris, France, Mar. 3, 1930.)

A NATION SEEKS AERIAL SAFETY

France Conducts Accident Prevention Work Under Central Agency

By W. L. FINGER*
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THE French government has long recognized that safety is just as vital a factor, if not more so, in the progress of commercial aviation as is power or performance of the plane. Yet, prior to the creation of the aerial safety section in the French ministry of air in April, 1929, relatively little effort has been made to study the question of aerial safety in a thorough and scientific way, and the safety factor did not keep pace with the other elements in aviation in its general progress since the war.

The experiments and study which have been conducted heretofore with a view to improving the safety factor were undertaken by separate and independent agencies, and did not have the advantage of a central authority to direct and coordinate them. Of course, the various airplane manufacturers had a concern for the safety element of their planes, but they had inadequate data as to the nature, causes, consequences, and even the number of accidents which befell their machines, and thus they devoted more thought to performance than to safety. The various French ministries interested in aviation—war, navy, colonies, and commerce and industry—all did a certain amount of work connected with aerial safety. Also the French Society for Aerial Navigation instituted in 1926 an inquiry into aerial safety, and in the same year the French committee of aerial propaganda set up a technical commission which arranged for research and contests to promote aerial safety.

Lacked Unified Action

But these various efforts would have been much more effective if they had been unified. When all the French air services were centralized in a newly created ministry of air in September, 1929, the first minister, M. Laurent-Eynac, determined to coordinate in one agency all the efforts tending to promote aerial safety, and he decided to make this a government agency, because it would have at its disposition all available information regarding accidents, the means necessary to investigate their causes, to inquire into the conditions under which the personnel and material are used, and to establish research laboratories and proving grounds. Furthermore, it could arrange for any trials deemed advisable, and, in short, could coordinate the efforts of all interested parties.

Such is the background of the recently created French central service of aerial safety and superior commission for aerial safety. The central service is the active body in the scheme; it conducts the necessary tests, gathers information, and makes appropriate recommendations. Its proposals are submitted to the superior commission, presided over by the minister of air and composed of some 12 high officials of various government bureaus interested in aviation. This commission, whenever it discusses technical questions of direct interest to manufacturers, usually invites qualified representatives of the industry to participate in the sessions and to give advice. If the recommendations of the central service are approved by the minister after he has examined them with the superior commission, they are promulgated and become effective immediately.

Safety Factor Studied

The central service of aerial security studies the safety factor in all phases of aviation, personnel, material, and the air routes themselves. It takes part in the inquiries following accidents; it centralizes information on defects found in equipment, on the imperfections in the instruction and training of personnel; it participates in the preparation of programs of research and of competitions designed to increase aerial safety; it sees to it that safety regulations prescribed by law are observed.

For the accomplishment of its duties the central service makes use of the following agencies:

(1) Technical correspondents in all government organizations interested in aviation and in all air transport companies. These correspondents study at first hand the conditions under which personnel and material are employed, report on unsatisfactory features, take note of unsatisfactory performances, and supervise the enforcement of safety regulations.

(2) An inspection and inquiry section, responsible for the collection of technical data necessary for the application of certain safety measures, for the proper functioning of the technical correspondents, and for supervising investigations after accidents.

(3) A statistical section, responsible for recording all the unsatisfactory results noted in the instruction and employment of personnel and in the use of flying material and airway equipment and for calculating the degree by which aerial safety increases in each phase—i. e., personnel, material, and air routes—as a result of the decisions taken.

(4) A research section, responsible for determining, with the aid of information supplied to it, the immediate steps to be taken to remedy each particular accident and for clarifying the elements of the problems to be solved to make the airplane safer.

The object of the central service is, of course, the elimination of accidents or conditions causing damage to life or property in air navigation. The importance of this work is illustrated by the following table for 1928, the latest year for which figures are available, showing the number of airplane accidents in France which were serious—that is, which involved death or injury to one or more persons:

Nature of operation	Number of serious accidents	People killed	People injured
Air lines (1 passenger killed for every 167,800 passenger-miles flown)	23	19	22
Flying schools	8	6	3
Training centers	5	4	3
Experimental tests	3	3	2
Commercial work	1		1
Races	5	6	1
Government aviation (military, naval, and colonial)	129	76	93
Total	174	114	130

The following table shows the causes of the various accidents, indicating the percentage of total accidents, percentage of people killed and percentage of people injured from each cause:

Cause	Percentage of—		
	Accidents	Killed	Injured
Mistakes of the pilot, due in part to imperfections of the plane	41	39	35
Mistakes of the pilot following motor trouble	13	16	24
Collision in flight	2	5.3	1.7
Motor breakdown	22.4	5.3	17.2
Defective material	6.6	.14	6.9
Poor atmospheric conditions	7.5	10.4	10.3
Poor condition of air field	1.5		
Ground accidents	1.8	2.6	3.4
Fainting of pilot	.4	.9	
Undetermined causes	1.8	6.5	.5

Ten per cent of the accidents led to the outbreak of fire either in the air or on the ground, and 21 per cent of the deaths were due to fire.

The total cost of French material destroyed through accidents was 180,000,000 francs—about $7,200,000.

The central service classifies the causes of accidents into four principal categories:

(1) Lack of professional skill on the part of pilots and other technical personnel.

(2) Lack of stability and of control of planes under certain circumstances.

(3) Defective operation of the motor power.

(4) Poor visibility and other dangers in the air.

Aims of Service

The central service is attempting to eliminate so far as possible these causes of accidents in the following way:

(1) The course of instruction required for a pilot's license, heretofore vaguely defined and varying in the different schools, is being improved and made uniform. This uniformity of instruction will be assured very soon by qualified professors trained in a special school which is to be created.

The equipment to be used for instruction in the training schools will be specially adapted for that purpose. In addition, care will be taken in the selection of student pilots to assign them for training in the types of machines best suited to their special talents.

The length of the training period of pilots has recently been increased, and it has been decided to require as a final stage of the training a certain amount of practice in blind flying.

At present pilots training for the military service and for commercial flying must have a minimum of 25 hours in the air as a basic requirement. After fulfilling this condition they pass to a finishing school, where they must spend from 15 to 30 additional hours in flight, of which from 8 to 10 hours must be blind flying. The instruction at this latter school is highly specialized, being adapted to the kind of service and type of plane which the student proposes to use.

Before a pilot is permitted to fly a plane for the transport of persons or merchandise he must be at least 25 years old and must have had at least 300 hours in the air, of which at least 100 must have been in a plane similar to the one which he is to use for the transport operations. If the pilot is to transport passengers, he must have made flights of equal length to those for which he is being employed.

As regards technical personnel other than pilots, a school for airplane designing engineers will be created to remedy the inadequate supply of this group of experts; a national school of applied aviation will be formed, to which only graduate engineers of the higher schools will be admitted; a corps of mechanical engineers will be formed to supplement the technical staff of the military air unit and to serve the needs of commercial aviation.

Most of the above measures concerned with personnel will be made effective during the course of the present year.

(2) The accidents attributable to the plane arise especially from lack of stability and from lack of control of the machine when flying under certain conditions. The accidents arising from "loss of speed," which claim so many victims each year, are due to these causes.

Nature of Action

To give the greatest possible degree of stability and safety to planes, the central service has taken the following steps:

Laboratories have been equipped with miniature models in order that the stability of planes in all normal and abnormal conditions of flight may be verified. Through these tests the degree of stability of airplanes already in use can be determined, and suggestions can be made to manufacturers as to how to increase the stability of planes which are still in the course of construction. Consequently, planes launched in the future should be appreciably more stable than those now in use.

The ministry of air has perfected a klaxon to give audible warning to the pilot when the plane has lost speed or has taken an unsafe angle of flight.

As soon as the weather becomes more favorable for flying, extensive experiments will be undertaken to determine the natural laws regarding

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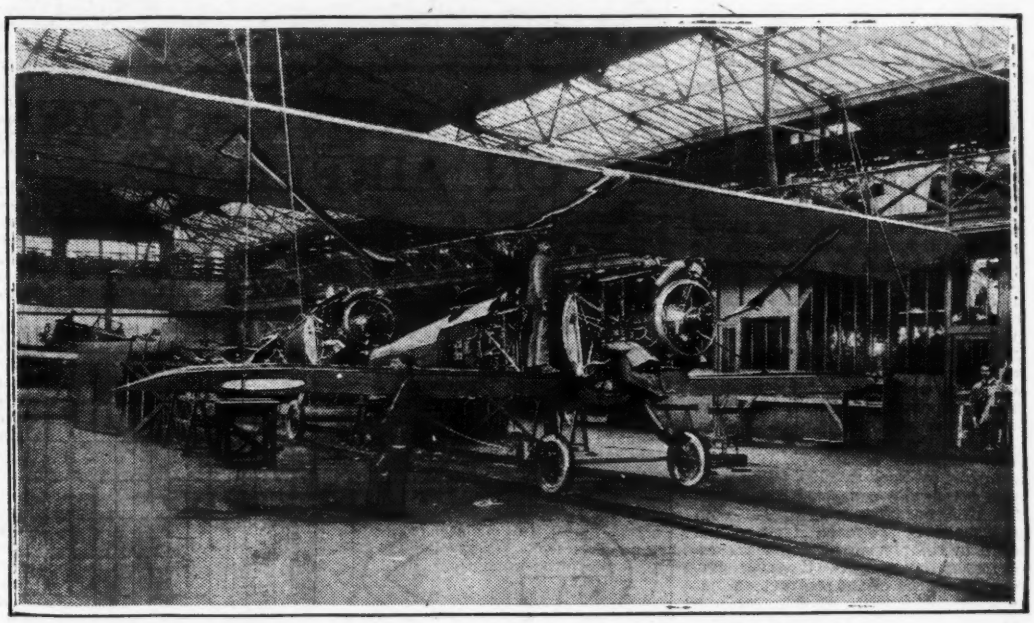


An interior view of the Breguet airplane factory at Villa Coublay, France

*Automotive Trade Commissioner to Europe.

AN INCIDENT OF AIRWAY WORK

Delay in Construction of Beacons Forms Basis of Federal Ruling

LIQUIDATED damages for delay in completion of erection of airway beacons under a contract with the Government form the basis of a memorandum issued by the Comptroller General of the United States, J. R. McCarl. The memorandum, issued in review of a previous settlement, deals with delays caused by rainy weather and by failure of the Government to make progress payments in accordance with the terms of the contract.

Full text of the memorandum follows:

A. C. Rice requested Feb. 14, 1930, review of settlement No. 0223706, dated Feb. 12, 1930, wherein he was charged with $100 as liquidated damages for 20 days' delay in the completion of contract number CC-580, dated Apr. 16, 1929, for the erection of certain airway beacons on the Indianapolis-Dayton airway.

Form of Contract

The contract was on Standard Form No. 23, standard Government form of construction contract, and required the major items of the work to be completed within 75 calendar days after date of receipt of notice to proceed and the entire installation to be completed within 90 calendar days after date of receipt of such notice with the usual stipulation in article 9 of the contract for deduction of liquidated damages on account of delays in completion of the work. The said article is quoted in 6 Comp. Gen. 650, 651, and need not be repeated here. Apparently, receipt of notice to proceed was received on May 5, 1929, and the major items should have been completed by July 19, 1929, and all items by Aug. 3, 1929. The work was not finally completed until Sept. 25, 1929, or after delay of 130 days in completing the major items and 53 days in completing all the work required by the contract. However, during the course of the contract various written orders were issued by the Government for additions to and changes in the work which required 34 additional days for completion. Crediting the contractor with said 34 days resulting from the change orders and 17 days on account of delays of inspectors in reaching the site of the various beacons on time is sufficient to account for any delays in the completion of all of the 11 beacons except No. 4. As to this beacon it was stated in a report dated Dec. 27, 1929, of the Commissioner of Lighthouses to the Secretary of Commerce, approved by the Secretary, that:

"In his letter of Nov. 20 the contractor states, with respect to the change at site No. 4 from 'A' type to 'B' type beacon as covered by Equalization Order No. 1745 dated Aug. 30, 1929, that when he was in Washington and discussed this matter with the Bureau he estimated that 28 days would cover the time necessary to obtain the additional material required and to do the work, but that subsequently he found that this was not enough time. In letter of Dec. 26 the contractor states that the actual time lost in waiting for the material was 28 days, and that 16 days' time was required to do the work. He also states that 2 days' time was lost in getting his men back to the site after the material arrived. Inspector Renn, in report dated Dec. 18, 1929, on this matter, does not agree with the contractor's statements as to time of receipt of certain items of the material, and concludes: 'I do not know the exact date that the tin arrived, but I think that Mr. Rice could have completed the installation in much better time than he did.'

"However, in view of the fact that all other major items had been completed at the time the Bureau ordered this change from 'A' to 'B' type beacon at site No. 4, and it was necessary for the contractor to move his foreman and electrical men from this to another job in Missouri, and to return them to this job when the material arrived, the Bureau considers that he should be given the benefit of the doubt which exists as to the exact extent of the delay occasioned by this change, and believes his request for 18 days' extension of time, in addition to the additional time stated in the equalization order covering the change, should be granted."

The contractor was ordered by a telegram dated Aug. 1, 1929, 2 days before his contract time expired, to change the beacon at site 4 from type "A" to type "B" and in letter dated Aug. 20, 1929, he was requested to state "extension of time for performance required" for making the change. He stated 28 days therefor on Aug. 20, 1929, and in letter dated Aug. 30, 1929, the contractor was informed by the Secretary of Commerce that his contract time would be extended 28 days on account of such change. However, as reported by the Commissioner of Lighthouses in his approved report, the contractor required more time than was estimated in order to secure material from such subcontractors to the site with which to perfect the change.

Article 3 of the contract provided that where changes were directed an "equitable adjustment" would be made in the time required for performance of such changes and the Secretary of Commerce has now reported that events which occurred after the allowance of 28 days on account of the change makes it equitable that the contractor be allowed 18 days additional to take care of the delays in securing the material at the site necessary to perfect the changes. It is not always possible to determine with any degree of accuracy at the time a change is ordered or during the progress thereof the time required to make a change, and if the Government has notice thereof, the equitable adjustment of time therefor may take place either at the time, during the performance, or when the change has been effected. Where factors of delay cannot be accurately determined when time adjustment is made, a readjustment of time may be effected when the facts have been determined. In view of the stipulation in article 9 that the facts of extent of delay as determined by the contracting officer shall be final and conclusive, there appears in this case insufficient reason to justify any conclusion different from that reached in the approved report that the contractor should be allowed 18 days additional or a total of 46 days in effecting the change at site No. 4.

Chargeable Time

There remains chargeable to the contractor 2 days' additional time.

It is urged that on certain fractions of days the contractor was delayed on account of rainy weather and that the Government delayed performance in failing to make progress payments in accordance with article 16 of the contract. However, there has been no sufficient evidence presented that the contractor was delayed through the failure of the Government to make progress payments or that there were any unreasonable delays in making such payments. It is, therefore, unnecessary to determine at this time whether delays of the Government in making progress payments may be sufficient to prevent the contractor from being charged with liquidated damages under article 9 of the contract. With respect to the delays during fractions of days because of rainy weather, it is sufficient to say that article 9 of the contract provided that the contractor should not be charged with liquidated damages for, among other things, unusually severe weather. Delays resulting from fractions of days of rainy weather cannot be considered as due to "unusually severe weather." Rainy days are to be expected in the latitude and longitude of the place where this work was to be performed, and unusually severe weather must be interpreted to mean such weather conditions as do not ordinarily occur at the place and season of the year.

Credit Is Noted

It results that the contractor will be credited with the further period of 18 days in the completion of beacon No. 4 and will be charged with liquidated damages for 2 days' delay in completion of the work at the stipulated rate of $5 per day per beacon. There will be certified for payment to the contractor an additional sum of $90 and otherwise the settlement is sustained.

LIGHT REFLECTORS ON AIRPLANES

DEVELOPMENT of a reflector for airplane navigation lights making possible a candlepower which previously could not be obtained is announced in a bulletin issued by the Aeronautics Branch of the Department of Commerce. Full text of the announcement follows:

At the request of the Bureau of Aeronautics, Navy Department, a reflector for airplane navigation lights has been developed by the aeronautic research division which makes possible much higher candlepowers than

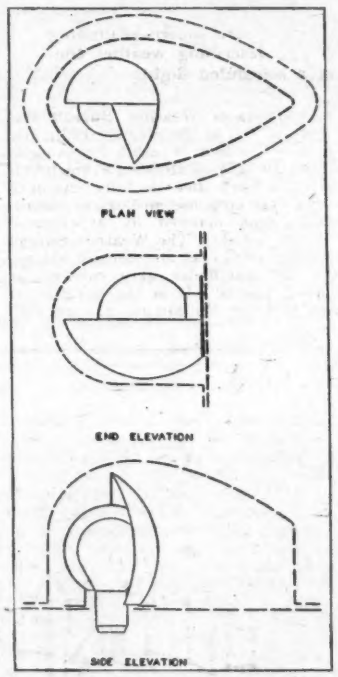


Fig. 1

have in the past been obtainable in such lights. The new reflector also acts as a shield confining the light to the angles required by the international conventions.

The reflector consists of two parts. Both of which in the present design are spherical surfaces. One of these is a hemisphere having its center at the position of the lamp filament. This reflector serves the double purpose of cutting off the light in certain directions from which no light should be visible and at the same time increasing the candlepower in the useful directions by about 50 per cent. The other surface is cut from a sphere of radius equal to the diameter of the hemispherical reflector. This reflector throws out a beam of light in the forward direction. Figure 1 shows the reflector in three views.

Figures 2 and 3 show the type of beam obtained from the new reflector. In Figure 2 the curve shows the candlepower at different angles in the horizontal plane for a navigation light to be used on the top side of the right wing. For the left wing the position of the reflectors would be reversed so that the luminous side would be away from the center line of the plane. Figure 3 shows the candlepower at different vertical angles above and below the center line. The incomplete symmetry in this case is largely accidental and due in part, at least, to the base of the lamp and the cutting away of the reflector to make room for it.

Having available only a definitely

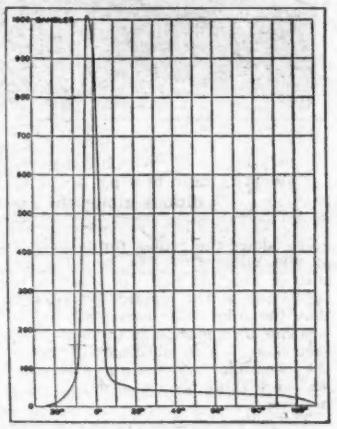


Fig. 2

limited number of lumens of light, it would be desirable to spread that light around in such a manner that the approaching pilot will always have the same time of warning. The maximum velocity of approach always occurs when the approaching planes are coming toward each other head-on. The direction of highest candlepower, therefore, should be the forward direction and the new reflector gives this result. The ideal distribution depends upon the speed of the planes, the angle of their courses, and the state of the atmosphere. No single distribution is best under all circumstances and a compromise resting on judgment must be adopted. The high intensity part of the distribution from the present reflector is too narrow,

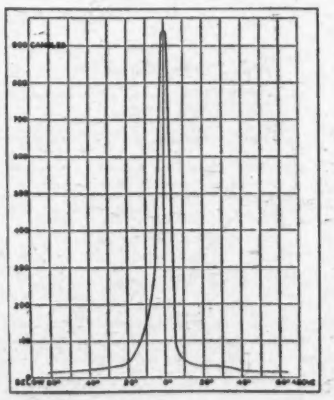


Fig. 3

but this can be corrected either by changing the design of the reflector slightly or by introducing small prisms into the cover which protects the light. Even in its present form, however, the reflector increases the range of the lights as has been shown by a visibility test.

Age Requirement For Mechanics

THE Department of Commerce Apr. 1 placed the minimum age requirement for any class of airplane mechanic's license at 18 years, it was announced by Clarence M. Young, Assistant Secretary of Commerce for Aeronautics. The announcement follows in full text:

The action of the Department is embodied in an amendment to section 66 of the Air Commerce Regulations through the addition of the following paragraph:

(F) The minimum age requirement for any class of mechanic's license is eighteen (18) years.

When the Air Commerce Regulations were drawn up several years ago the minimum age requirement for any class of mechanic's license was purposely omitted, because at that time there was no precedent to guide the Department of Commerce, and those drawing up the regulations did not wish to place any undue burden on the industry or the mechanics.

Since that time experience has taught us that the minimum age requirement of 18 years is the lowest we can permit while keeping in mind the highly important part the mechanic plays in the safe operation of aircraft and the need for mature judgment and the constant display of vigilance.

TELLING PILOTS WHAT TO EXPECT

Weather Information Transmitted Speedily by Means of Automatic Typewriter System Which Spans Continent

The following article is presented in full text as issued in an air commerce bulletin by the Aeronautics Branch of the Department of Commerce:

STEPS have been taken to develop further the weather service on airways by the installation of 2,400 miles of additional teletype service, with a total of 5,650 miles by the end of this fiscal year. The teletype service utilizes a leased telephone circuit over which signals are transmitted by an automatic typewriter providing a typewritten record on all teletype machines in the circuit. The transmission is at the rate of 40 words per minute. The circuits of the teletype and the weather reporting stations are shown on the map. The service is to be extended next fiscal year to include about 8,000 miles of teletype. The circuits are laid out on a long line basis to provide communications between the weather-reporting and radio stations on the route as follows:

Richmond-Washington-Hadley Field-Boston.
Hadley Field-Bellefonte-Cleveland.
Cleveland - Toledo - Detroit - Kalamazoo-South Bend-Chicago.
Chicago-Iowa City-Omaha-Kansas City-St. Louis-Springfield.
Omaha-North Platte-Cheyenne.
Cheyenne-Rock Springs-Salt Lake City.
Salt Lake City-Reno-Sacramento-Oakland.
San Diego-Los Angeles-Fresno-Oakland.
Oakland-Medford-Portland.

Current weather information is collected on an hourly basis from the principal intermediate landing fields and critical points along the route. The weather-reporting points are shown on the map referred to. Weather information is collected in sequence from each reporting station at the scheduled period set for each circuit. It takes from 4 to 5 minutes to make the weather collection. At terminal points where a number of airways converge the collections from the respective circuits are made just prior to the quarter-hour periods in the order that the broadcast of weather information to the pilot in the air is made. This system of weather collection is coordinated with the radiobeacon service, the beacon being stopped on the exact quarter-hour period for the identification by station announcement and the broadcast of current weather information. In this manner detailed spot-weather information is given along the routes for a distance of 200 miles from the broadcasting station, together with the weather information at the distant terminal, so that the pilot will receive his route-weather information at the same time each hour, but in addition will receive the weather information from the station making the broadcast every 15 minutes.

U. S. Weather Bureau.

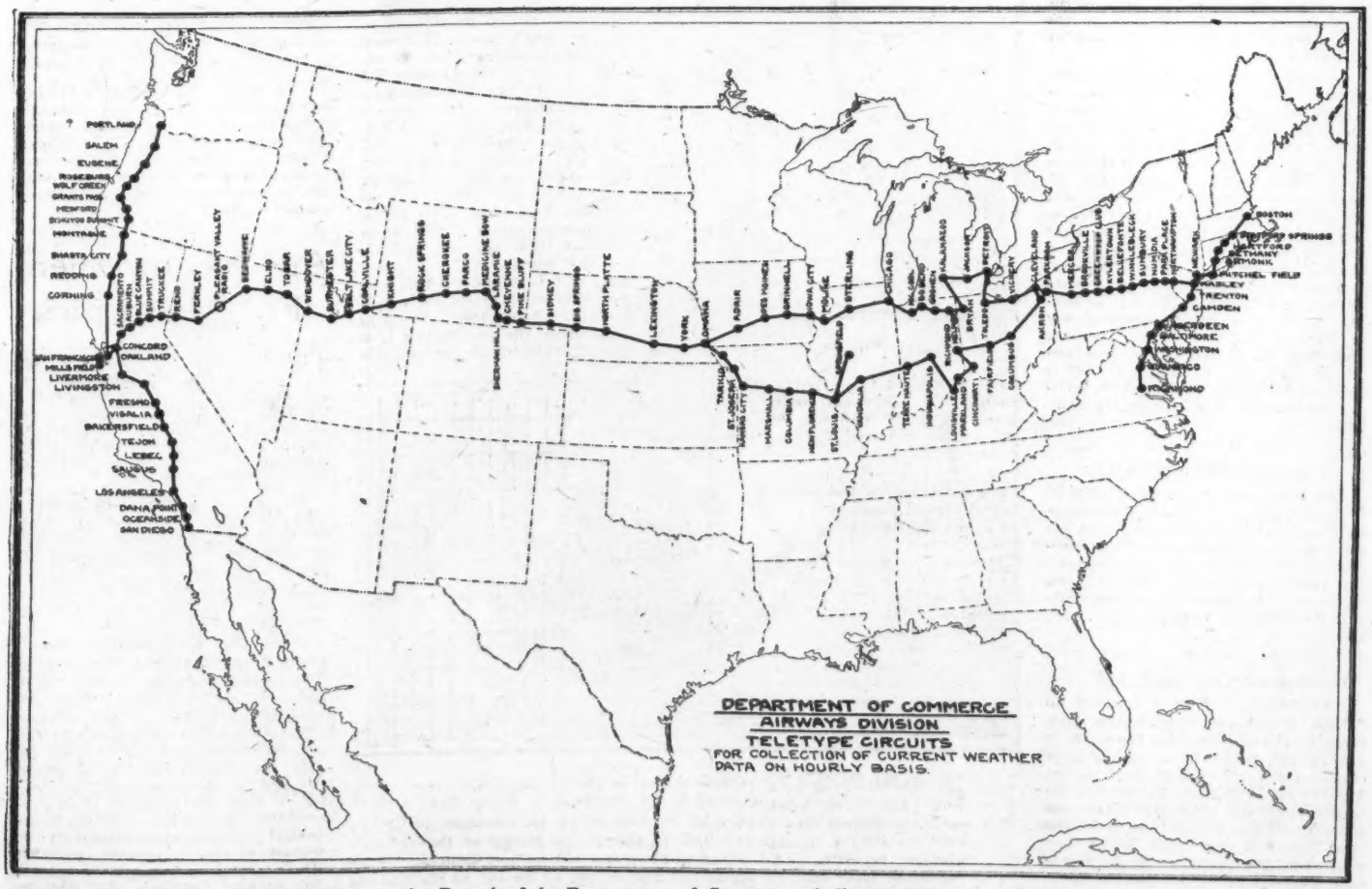
A pilot and a Weather Bureau expert are here shown examining teletype tape bearing a special message describing weather conditions along the route of a scheduled flight.

The collection of weather reports by teletype is distributed to the local United States Weather Bureau stations as well as the airways radio stations. The local Weather Bureau station is usually established at the municipal airport and is fully equipped with standard meteorological instruments and manned by experienced meteorologists. The Weather Bureau station serves as the control station for the particular area covered by these reports. It is the practice of the Weather Bureau to arrange with airports and air-transport companies to furnish weather reports at the points of contact by designating employes of the airports and air-transport companies as official weather reporters, for which a nominal consideration is paid. The Weather Bureau usually furnishes the required meteorological instruments. The weather reporters furnish data regarding ceiling, visibility, wind direction and force, temperature, and barometric pressure. Under this plan the Boeing Air Transport is furnishing weather reports from intermediate terminals along the transcontinental airway west of Chicago and from a number of airports on the west coast. Similar arrangements have been made on the Richmond-Boston route with the municipal airports, Army, and Navy. The teletype installations under this plan are made by the Department of Commerce, and weather data are collected hourly. The teletype is operated in conformity with the regulations of the Airways Division and directly under the supervision and control of the assistant airways traffic supervisors at the control centers. The teletype circuit is not available for any communications other than the authorized traffic, and abuse of these privileges will lead to the discontinuance of the weather-service communications to the airports and stations violating regulations.

In Airport Centers

At cities where there are a number of airports, arrangements are usually made by the Weather Bureau with the different airport officials in the area to furnish data covering ceiling and visibility at each airport. These reports are combined with the instrumental observations at the local Weather Bureau station and form the basis of the weather reports broadcast by radio. When weather conditions at any airport in any area are such as to affect the safety of landing, this information is communicated to the local Weather Bureau station by the airport official. The Weather Bureau representatives in charge keep in touch with weather conditions at all fields in this manner and furnish reports covering landing

[*Continued on Page 11*]



This map, issued by the Aeronautics Branch of the Department of Commerce, indicates the extent of the system provided for rapid transmission of weather information to aviators. Extensions of this system will soon be completed.

FOREIGN NEWS ABOUT AVIATION

Reports Received By the Department of Commerce From Representatives Abroad

Gliders in Europe

ENCOURAGEMENT is being given glider flying in European countries, according to recent reports. There are approximately 200 glider clubs in Germany. The Rhoen-Rossitten Gesellschaft at Frankfurt am Main is the largest glider organization and has schools in different parts of the country. Two thousand private glider licenses have been issued to students. Over half that number have been granted since 1928. These licenses are given, on request, to each student after he has studied at a school before he may attempt cross-country flying. There are in Germany between 300 and 400 gliders. These cost from 1,500 to 8,000 marks. It was reported that plans are being made by the Rhoen-Rossitten Gesellschaft to hold an international glider congress at Darmstadt, Mar. 8-10. This congress was to discuss the technical and practical problems which the study of glider flying involves.

In France there are two organizations, the C. Ae. U. (University Aeronautics Club) and the Avia, which encourage those interested in this phase of flying. The C. Ae. U. teaches its members to fly and since Sept. 1, 1929, nearly 700 starts have been made. This organization helps form glider clubs. They will lend both equipment and ground for practice and will help any club secure its own equipment. The Avia, an organization formed primarily for research work, will aid clubs choose appropriate sites, as well as furnish plans for the construction of gliders. They recommend that students begin studying glider flying with monoplane rather than with biplane gliders and that no attempts be made to start from buildings or abrupt inclines. Every Sunday morning at 8:45 at Stain's field, near the Villette gate, Paris, the C. Ae. U. gives instruction in glider flying to its members.

Gliding in Great Britain has begun. The British Gliding Association was formed recently. The London Gliding Club is associated with this organization. It is to receive from the association a German glider with which to begin practice work. The association is making arrangements for gliders of an approved type to be built in England. It will issue drawings to enable clubs to build their own gliders.

In Italy there are no glider clubs but the air ministry maintains three schools located at Pavullo in Tuscany, Luigi Gavatti Airport in Genoa and at the Monte Mario field near Rome. These schools operate three months in the Summer and teach boys 17 years of age who must be members of the Avanguardisti (Fascist boy scout movement). The gliders used are constructed in Italy according to German design. (A. Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 28, 1930; W. L. Finger, automotive trade commissioner to Europe, Paris, France, Jan. 31, 1930; H. A. Burch, trade commissioner, London, England, Feb. 27, 1930, and Mowatt M. Mitchell, commercial attache, Rome, Italy, Jan. 13, 1930.)

Canadian Photography

AIR photographs covering 70,000 square miles of Canada were made by the Royal Canadian Air Force for the Canadian department of the interior which is exploring and mapping the vast northern regions. (A. H. Thiemann, assistant trade commissioner, Ottawa, Canada, Mar. 10, 1930.)

Moratorium Granted

A MORATORIUM was granted to the Rohrbach Metallflugzeugbau, G. m. b. H., of Berlin by the German government which holds 82 per cent of the stock. The first work to be undertaken by Rohrbach will be the construction of a "Romar" for the French and the reconditioning of the two Romar flying boats which are said to be the property of the Deutsche Luft Hansa. (A Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 25, 1930.)

Reserves in Panama

BY AN executive decree issued the first week in March a circular area of land with a radius of three miles has been ordered set aside in the vicinity of every town and city in the Republic of Panama for the establishment of airports. The decree states that in the future no land will be granted within the limits of municipalities which have not yet secured clear titles to their property. The treasury department has been instructed to take the necessary steps to enforce compliance with this decree, which carries the signatures of the president and all the members of his cabinet. (Fred C. Rogers, office, commercial attache, Panama, Republic of Panama.)

The "Duck" Plane

TEST flights of the "Ente" or "Duck" plane will be continued in the near future by the Focke-Wulf Flugzeugbau A. G. of Bremen. They have reconditioned the plane which was wrecked in a crash in the Fall of 1927 after it had successfully passed its trial flights. The plane is only slightly changed from the original model as examination by German aeronautic authorities has shown that the crash in 1927 was not due to any faulty construction principles. (A. Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 28, 1930.)

At Bonn University

A FLYING school, which was recently opened at Bonn, is expected to aid private flying in Germany. The Academic Flying Club (Akademische-Fliegergruppe) of the university was recently presented with a plane and they expect to purchase another shortly. During the course of 1929 more than 1,300 sports flights were made under the auspices of the club. (A. Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 25, 1930.)

Reduction in Subsidies

IN the 1930 budget of the Czechoslovak ministry of public works, 36,212,410 crowns (approximately $1,071,887, are for the benefit of commercial aviation; of this sum approximately 7,490,000 crowns are for the Czechoslovak state air lines. A reduction of 750,000 crowns is shown in the 11,000,000 crowns granted as subsidies to the International Aerial Navigation Company (CIDNA) for flights on the lines from Prague to Paris, Prague to Warsaw, and Prague to Vienna, and to the Czechoslovak Air Transport Company for flights on the lines Berlin-Prague-Vienna, and Prague-Marienbad-Kassel-Rotterdam. Other sums are 6,000,000 crowns for the purchase of aircraft and 7,300,000 crowns for the purchase of flying field sites, equipment and for construction work on existing fields. An increase of 560,000 crowns is provided in the total 2,400,000 set aside for study and research in aviation. Provision for the building and equipment of a central training school for pilots is included in this sum. (Arthur C. Frost, consul general, Prague, Czechoslovakia, Feb. 5, 1930.)

To Reduce Costs

THE Deutsche Luftfahrt Verband (German Aeronautics Association), an organization embracing all phases of German aeronautics, founded in 1902, has as one of its chief aims the reduction in the costs of sports flying. Through its efforts insurance premiums and the starting and landing charges for sports pilots have been greatly lowered.

Of the 45,000 members in 1929, 6,407 were youths distributed among 130 groups of pilots and 60 flying schools. The number of balloon pilots advanced during the year to roughly 250. The D. L. V. owns about 60 balloons, representing a capital of some 600,000 marks, with which about 600 ascents were made in 1929. The association and its member groups have approximately 300 gliding and soaring planes, and 115 gliders are being constructed to be put into operation at the beginning of the new flying season. More than 1,000 members are trained glider pilots, while 200 soaring pilots have passed their tests. Training schools for gliders are maintained at Grunau in Silesia, Schwarzenberg in Saxony, Doernberg near Kassel, Wangen in Allgau, the Wasserkuppe in the Rhoen mountains and Rossitten in East Prussia.

In the Summer of 1929 the D. L. V. owned 68 planes with motors. Twenty-two planes were ordered in the course of the Winter, so with the 40 planes belonging to the Deutsche Luftfahrt G. m. b. H., which is a member of the association, and 3 light planes obtained by different clubs, there will be 133 sporting planes available for the coming year. (A. Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 28, 1930.)

The unearthly looking person shown in the upper of the two phonographs here reproduced is Lt. A. Soucek, Navy flyer, wearing the strange garb used by him as protection against cold in flights which resulted in the establishment of new altitude records. The lower photograph shows Lt. Soucek equipped with oxygen apparatus and mask, as he sat in the cockpit just before taking off in an attempt to set a new altitude record for seaplanes.

Increase Expected

FLYING in the Northwest Territories of Canada is expected to increase because of the opening of the Coppermine River district to prospectors on July 1. One prospecting company, which has used airplanes extensively in its search for minerals in the north country, is reported to be planning the equipment of a fleet of airplanes at a cost of more than $1,000,000 in order to prospect the area. Other commercial operators are expected to operate in the district which extends from the 105th to the 116th longitudes and northward to the North Pole from the 65th parallel with the exception of the Thelon Game Sanctuary. (A. H. Thiemann, assistant trade commissioner, Ottawa, Canada, Mar. 10, 1930.)

New German Service

A NEW flying service company formed in the Rhineland was scheduled to commence flying operations Mar. 1. This is a private air traffic company, known as the Luftdienst Mittelrhein G. m. b. H. (Middle Rhine Air Service Company) with headquarters at the Erbenheim airport, the flying field for the cities of Wiesbaden and Mainz. This firm will use a closed Focke-Wulf traffic plane as well as three sports planes and intends to purchase an additional training plane. It will carry passengers to and from the airports in the vicinities, and on round-trip flights over the Rhine district. It will also engage in propaganda flights, air surveys, advertising flights and will charter sports planes to private pilots and for training purposes. It has, in addition, set up a sales organization. (A Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 27, 1930.)

Polish Aviation

THE government-owned air service, the "Lot" Company, of Poland, reports 5,976 flights accomplished during 1929, an increase of 86 per cent over 1928. A total of 1,382,000 kilometers was covered, and 15,000 passengers were carried. Mail and newspapers carried amounted to 53,000 kilos and merchandise and baggage to 391,400 kilos. The average regularity of flights was 95.6 per cent, with no fatal accidents occurring during the year. (Gilbert Redfern, assistant trade commissioner, Warsaw, Poland, Feb. 15, 1930.)

Air Congress

AN AIR CONGRESS is to be held in Uruguay sometime during 1930, the exact date to be fixed. This congress will be held under the auspices of the Centenario Committee at the Escuelia Militar de Aviacion. All important aeronautical subjects will be proposed for consideration. In connection with the congress it is proposed to hold an international aeronautical display and exposition of military planes, transports, aviation motors, aerial photography, aerology, signals, etc. (Connie R. Herron, Assistant Trade Commissioner, Montevideo, Uruguay, Jan. 18, 1930.)

Radiotelephony's Latest Uses

THE constantly increasing use of radiotelephony by the Army Air Corps in conversation has brought an opportunity to review interesting experiences and observations connected with that type of activity.

Full text of a statement on this subject as issued by the Army Air Corps, follows:

The roar of the motors imposes a considerable handicap upon airmen who attempt to carry on conversation in the air via radio. For this reason experiments have been made by Air Corps officers at Rockwell Field, Coronado, Calif., on certain words which can be heard to the best advantage. In all, 500 words were selected for the first elimination list, and this number was subsequently cut to an even 100. Consonants especially are hard to hear, except where the vowels in the words predominate. A misunderstanding in messages easily enough could cause damage, and so the officers have spent more time than can be imagined in selecting their list of words, the favorites being "right"; "left"; "stop"; "okey"; "good" and "hit," all of which more or less referring to target practice. In the word "right" for example, the "r" and the "t" are scarcely heard, but only the vowels "—igh—" and in "good" it is the "—oo—" and so on.

The act of telephoning by radio from plane to plane has advanced to such an extent at Rockwell Field that the game today is no longer an experiment, nor even an amusement. It is almost an every day business at the field at present. A check-up of recent radio activities at the field records at least five occasions where the business in hand could not have been performed without the use of the well known earphones.

For instance, there is the concrete case of Lt. C. H. Howard. His performance of the duties of post exchange officer demaned so much of his time that not enough daylight was left for him to get in the requisite amount of flying time to entitle him to draw flying pay. Availing himself of the opportunity to make a trip by air on official business, he was about to make a landing at the field on his return when it suddenly occurred to him that if he could stay up for another half hour he would by just luck squeeze in the required amount of flying time. He telephoned down to Lt. Valentine, commanding officer of the 11th Bombardment Squadron, asking if it was true that he needed only another half hour. After checking up the records, Lt. Valentine phoned back to Lt. Howard that his calculation was correct. The latter then requested and received permission to keep the plane aloft for another 30 minutes.

An Interesting Case

In another instance both the pursuit squadron and the bombing squadron were pressed for time to complete their full training schedule of target practice. Bad weather and fog handicapped the training throughout the week, but on one day the sky promised to remain clear for about an hour or so before the fog closed in again. Because of the closeness at Rockwell Field of the machine gun target for the pursuit planes to the target for the bombardment planes, neither squadron can hold target practice at the same time.

The 95th Pursuit Squadron took off on target practice first, and while they were practicing the bombers were climbing to their bombing altitude. Yet there was no way for them to tell when the pursuit planes were through. At the proper moment the bombers were notified by radiotelephone that they could proceed with their practice. No time was lost and the bombers began carrying on where the pursuit planes had left off, and in this way the training schedule for both organizations was completed just before the fog rolled in again.

A third case presented itself when, during a cross-country flight from Rockwell Field to San Francisco, the 11th Bombardment Squadron, led by Lt. Valentine, the commanding officer, encountered bad weather. Instead of the weather improving it grew worse when Baker's Field was reached. Confronted with the possibility that if the planes continued on to San Francisco they might meet such bad weather that they could not land, nor would they have enough gas to enable them to return, Lt. Valentine instructed his radio operator to tune in on the Western Air Radio Reports. These came each hour, and through them the squadron learned that the weather was clearer ahead. The bombers continued northward without risk and were soon in the clear.

The aerial or antenna of the planes, instead of being stretched across the wings as might be presumed, are lowered overboard to trail behind as soon as the plane is in the air. These aerials are termed "fish" because of the strange shape of the six-inch leads at their ends. These "lead fish" dangle behind 125 feet, as if attached to a fish line, and every now and then a pilot forgets to reel in the "fish" before landing. This causes no damage to the plane but does wreck the antenna.

Aid in Engineering

During a recent landing at Oceanside, Calif., this antenna was rigged with one end to a fence post, and a steady communication was established with Rockwell Field, proving that the radio can be invaluable during a forced landing in some wilderness.

In the original tests while in the air the generation was produced by a miniature propeller erected on the fuselage. The little prop was whirled by the wind like a toy windmill. But batteries are used now and work better.

U. S. Navy.

A new chapter was added to the history of noted aviation achievements when this new Martin bomber, carrying a 1,000-pound bomb, made a dive of more than a mile during which it attained a speed of 250 miles an hour. It was the first time a plane had been subjected to the strain of such a performance, with the culmination coming in a "pull-up" at a speed of 260 miles an hour. The test was made Mar. 21 at the Naval Air Station near Washington with Test Pilot William H. McAvoy at the controls of the craft.

REVIEW OF MIDWEST AIR PARLEY

THE following review of the legislative air parley of the Midwest, first of its type, appears in an air commerce bulletin issue by the Aeronautics Branch of the Department of Commerce:

Called through the cooperation of Governor Walter J. Kohler of Wisconsin, the Wisconsin Legislative Interim Committee on Aviation, and the Milwaukee Chapter of the National Aeronautic Association, the first legislative air parley of the Midwest States was held in Milwaukee, Wis., in February.

Broad Discussion

An excellent program was prepared and resulted in bringing forth much interesting discussion. Presided over by John M. H. Nichols, executive vice president of the Milwaukee Chapter of the National Aeronautic Association, the first session opened Feb. 24 with an address of welcome by Governor Kohler. Mr. Nichols then outlined the purpose of the conference, after which Harry H. Blee, director of aeronautic development, Aeronautics Branch, Department of Commerce, spoke on The Department of Commerce and Civil Aeronautics.

Following a recess, Reed G. Landis, chairman of the Aeronautical Navigation Commission of Illinois, spoke on State Agencies of Control and Enforcement of Aeronautical Laws. His address was followed by one on the subject of Transport Companies and Legislation, by Trever Williams, of Universal Air Lines.

The second session was presided over by Rowland W. Fixel, of Detroit, J. B. Neill, director of Curtiss-Wright Flying Schools, delivered a paper on Flying Schools and Legislation; and John M. Vorys, director of aeronautics of the State of Ohio, spoke on Airports and Highways.

Prof. Carl Zollman, lecturer on air law of Marquette University School of Law, and Prof. Fred D. Fagg jr., managing director of the Northwestern University School of Law, spoke on Air Laws as Defined by the Courts, at the afternoon session, of which Mr. Landis was chairman. After this discussion the resolutions committee, headed by Mr. Fixel, which previously had retired for deliberation, made its report.

The following resolutions were adopted:

I. Whereas, the Governor of Wisconsin, Walter J. Kohler, the Wisconsin Legislative Interim Committee on Aviation, and the Milwaukee Chapter of the National Aeronautic Association have all coperated in the calling and sponsoring of the legislative air parley of Midwest States: Therefore be it

Resolved, That a vote of thanks be expressed to them for the hospitality and pleasure afforded to those attending this parley.

For State Provision

II. Resolved, (1) That the legislative air parley of the Midwest States recommends that each State provide by law for the purchasing or leasing of ground for airports by municipalities.

(2) That each State provide for the promulgation of regulations setting forth the minimum requirements to be met by all airports and landing fields, with suitable provision covering fields for emergency and temporary use, said regulations to conform to the requirements and recommendation of the United States Department of Commerce.

(3) That each State should undertake the development of a State system of airways to connect with and conform to the standards of the Federal system and should grant State aid, first, in completing airports on the Federal airway system and, second, in completing the State airway system.

(4) That each State require by law the air marking of airports according to the uniform standards laid down by the United States Department of Commerce.

(5) That each State require by law marking of municipalities, said marking to conform to the standard recommended by the United States Department of Commerce.

(6) That a competent State official have authority to remove confusing air markings.

(7) That the conference recommends the gasoline tax as the most equitable form of taxation for aviation and that the income derived from any aviation taxation be expended solely for the encouragement and development of aviation.

III. Whereas the increased safety of the air-traveling public and the security of the aviation industry depends in large part upon the establishment and maintenance of airways linking up all centers of population; and

Whereas the system of State and Federal cooperation in development of good roads, outlined in the Federal road act of 1916 and amendments thereto, has produced such generally satisfactory results: Be it

Resolved, That it is the sense of the meetings of the Midwest States air parley that it go on record as indorsing the principle of the Federal road act applied to the establishment of a national system of airways and recommend to Congress the passage of such Federal enabling act; and be it further

Resolved, That a copy of this resolution be sent to all Members of Congress.

Meeting Advocated

IV. Whereas the Hon. Louis L. Emmerson, Governor of the State of Illinois, through the Illinois Aerial Navigation Committee and the Chicago Association of Commerce, through its aviation committee, have tendered an invitation to the legislative airparley of Midwest States, convened in Milwaukee, Feb. 24 and 25, 1930, to attend a national conference on aerial legislation in Chicago in conjunction with the national air races, Aug. 23 to Sept. 1, 1930, and in collaboration with the Air Law Institute of Northwestern University, and

Whereas it is the purpose of this air parley to advance the aviation industry through intelligent and uniform aerial legislation in each of the States: Therefore be it

Resolved, That this legislative air parley of Midwest States, now convened, go on record as favoring such a national conference; and be it further

Resolved, That the invitation to this national conference on aerial legislation in Chicago be accepted and each delegate hereto be urged to further this national conference in every way possible.

Council Is Favored

V. Resolved, That the governor of each of the Midwest States represented at this conference be requested to appoint one or more persons (each State to have but one vote) to constitute a Midwest States aeronautical council; and it is further recommended that the first appointee of the Governor of Wisconsin serve as the first temporary chairman of such council: Therefore be it

Resolved, That a permanent organization be created and that the membership of this council be appointed in

[Continued on Page 10]

GERMANY'S SUBSIDY OF AVIATION

Reports Received by Department of Commerce Outline Recent Developments

REPORTS on the condition of the aviation industry under subsidy in Germany have been received by the aeronautics trade division of the Bureau of Foreign and Domestic Commerce, Department of Commerce, from A. Douglas Cook, assistant trade commissioner at Berlin.

The full text of the statement based upon these reports which has been issued by the division follows:

Handicapped by a shortage of orders and a lack of capital the Rohrbach firm has not been able to meet its current obligations and has not been able to pay wages to its workmen since Jan. 1, 1930, nor to its clerical employes since Dec. 1, 1929, it is reported. Of the federal subsidy of 9,000,000 marks during the fiscal year 1929 the Rohrbach company was supposed to receive 300,000 marks. The original division of this subsidy was proposed as follows:

Junkers, 2,000,000 marks; Dornier, 1,600,000 marks; Bayerische Flugzeugwerke, 900,000 marks; Heinkel, 700,000 marks; Albatros, 400,000 marks; Rohrbach, 300,000 marks, and Klemm, 200,000 marks.

The remainder, or 2,900,000 marks, was to be apportioned to various firms in the airplane motor and other auxiliary industries.

Reduction Intended

Under the rationalization and reorganization plan of the federal traffic ministry, intended to reduce basically the number of manufacturers to a minimum of highly efficient producers, it became evident that the further existence of a large part of the German aeronautics industry was only a matter of time. The capacity of the domestic market was further curtailed by the agreements between airplane users, and foreign markets were largely excluded, due to the comparatively high prices of German planes.

The government proposed to raise a loan in order to enable the manufacturers to rationalize their operations following the cessation of federal subsidies. Fortunately for the manufacturers, however, the sum of 9 million marks was voted in an additional government budget. This sum has been distributed as follows:

Junkers Airplane Works, 1,600,000 marks; Dornier, 1,600,000 marks; Bayerische Motorenwerke, 1,100,000 marks; Heinkel, 900,000 marks; Siemens Motor Company, 900,000 marks; Junkers Motor Works, 750,000 marks; Bayerische Flugzeugwerke, 700,000 marks; Albatros, 400,000 marks; Focke-Wulf, 300,000 marks; Rohrbach, 300,000 marks; Arado, 250,000 marks; Klemm-Daimler, 150,000 marks, and Raab-Katzenstein, 50,000 marks.

Payment of Funds

The Reichstag made the payment of the above funds dependent upon further rationalization measures and the government authorities have proposed a curtailment in the federal funds for aeronautics to 6,000,000 marks for the fiscal year 1930. The budget for the fiscal year 1930 will probably be voted on in the early part of March, 1930. Because the available funds will be insufficient to aid the entire German aeronautics industry, the federal ministry will on Apr. 1 cut the number of recipients of government subsidies to four airplane factories, the Junkers, Dornier, Heinkel and Bayerische Flugzeugwerke, and to the Siemens, Junkers and Bayerische motor works. The three motor factories are the prominent exponents of German airplane motor production—for water-cooled, air-cooled motors and crude oil motors. Junkers, Dornier and Bayerische are the largest and most efficient traffic plane factories. Heinkel does not manufacture traffic planes, but is the leading German manufacturer of pontoon-equipped seaplanes. The ministry also decided that the catapult design as well as the training planes developed by Heinkel should be retained. All other firms were advised by the traffic ministry that they could not expect any further subsidies or research orders from the government, as well as no further orders from airway operators cooperating with the government, and that they could only receive an occasional subsidy if they distinguished themselves with some unusual constructional innovation of marked efficiency. The traffic ministry advised the Luft Hansa, the German Traffic Pilot School and the German Testing Institute for Aeronautics to purchase their planes exclusively from the four firms remaining on the government subsidy list.

Objection Aroused

Considerable objection to the traffic ministry's policy has been aroused, especially as this decision causes a halt in the manufacture of planes of so-called mixed construction. The opponents to this plan state that young manufacturers who have proved their worth should be assured a foothold in manufacturing by a subsidy of from 100,000 to 200,000 marks a year. They further state that with the introduction of the four-manufacturer system the sound competition now existing will be removed.

The federal government owns 82 per cent of the capital stock of the Rohrbach Metallflugzeugbau G. m. b. H. (Rohrbach Metal Aircraft Co., Ltd.). This firm was supposed to receive 300,000 marks from the federal government during the fiscal year 1929, but only 100,000 marks have been turned over to it. This sum was further reduced by 23,000 marks due to the cost of examining and auditing the Rohrbach books and various other notarial proceedings which the traffic ministry demanded, so that the firm has received only 77,000 marks from the government.

In an open letter to the traffic ministry, the opponents to the plan inaugurated asked why the Rohrbach firm was not paid its full share of the subsidy and why a firm with such favorable prospects in foreign markets should be allowed to fail. They also pointed out that although two all-metal airplane factories may be too much for Germany at present, attempts should be made to get the two factories to cooperate rather than to eliminate one of them.

The Reichstag traffic committee has received a petition from the staff of the Rohrbach works in which the request was made that outstanding wages and salaries be paid from the funds at the disposal of the traffic ministry, despite the imminent bankruptcy of the concern. The ministry informed the Reichstag that such a demand would be impossible, stating that their funds were available only for the technical and economical promotion of aeronautics.

The Raab-Katzenstein Flugzeugwerke G. m. b. H., of Kassel, is said to have stopped its payments and applied for a creditors' adjustment in order to avoid bankruptcy. At the same time an application for a moratorium was reported to have been made to the creditors with the suggestion that their claims would be paid in full if payments could be deferred some time.

Insolvency of Firm

The insolvency of the firm was said to be due to the cancellation of all bank credits and to the fact that the sum of 200,000 marks, which was expected from the federal traffic ministry, was reduced to 50,000 marks.

Negotiations with American interests to replace the government subsidy failed so that the considerable Asiatic business of the concern could not be developed any further, according to reports. The firm had further difficulties following the decision of the City of Kassel that it could no longer maintain the airport. It is possible that when the airport is closed on Apr. 1, the firm will move its plant to another city and will later resume operations.

AIR TRANSPORTATION LIABILITY

The following is the full text of a statement issued by the Aeronautics Trade Division of the Bureau of Foreign and Domestic Commerce:

REGULATIONS covering air transportation liability have been drawn up at a conference at Warsaw as the result of a number of years of work of the Comite International Technique d'Experts Juridique Aeriens (Citeja), (Technical International Committee of Judicial Air Experts). This agreement was signed on Oct. 12, 1929 by Germany, Australia, Brazil, Denmark, France, Great Britain, Northern Ireland, Union of South Africa, Italy, Luxemburg, Poland, Switzerland and Jugoslavia. Other European and non-European countries reserved the right of signature up to Jan. 31, 1930.

The chief part of the agreement is formed by the regulations regarding the liability of air transport operators. These regulations are binding and cannot be waived by the transportation contract. If transportation is effected by a number of consecutive airway operators, each of these concerns is a party to the transportation contract in so far as it applies to that part of the transportation made under the management of the particular concern.

There are contained in this agreement a number of regulations covering transportation documents, such as tickets, baggage checks and air bills of lading. These regulations are based chiefly on the documents introduced by the International Air Traffic Association (Iata). The International Air Traffic Association, which covers all European airway operators participating in international air traffic, had previously introduced such documents for the use of its members.

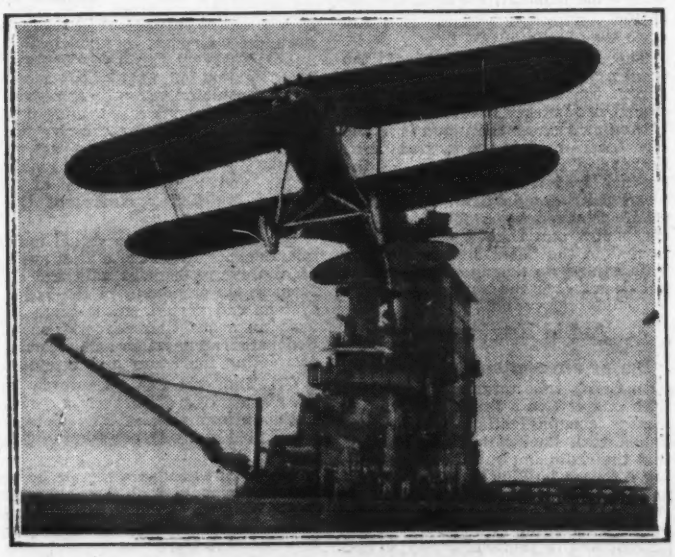
Liability for shipments to be transported by air is to be regulated in accordance with the agreement and not in accordance with other legal regulations. Liability regulations are applicable for the period during which merchandise or baggage is in the care of the airway operator within an airport or on board a plane, in a landing outside of an airport or at some other point. It does not apply to transportation outside an airport by other means of transportation than airplanes. If in execution of the air transportation contract other vehicles than airplanes are used for the purpose of loading, transshipping or delivering, it is assumed that the incident leading to the damage occurred during the flight. In the transportation of freight and baggage the operators are not liable for faulty flying or navigation of the aircraft if they can prove that they and their employes took all the necessary measures to prevent the damage. The maximum sum for which an operator is liable for freight and baggage is fixed at 250 gold francs ($50) per kilo, and for objects which were in the care of the passenger, 5,000 gold francs ($1,000) per passenger.

During the period that the passengers are on board, entering or leaving the plane, the airway operators are liable for damages occurring through death or personal injuries to passengers, unless the operators can prove that they and their employes took all necessary measures to prevent the damage or that it was impossible for them to take such measures. If the damage is wholly or partially the fault of the injured, the airway operator is not liable, or is liable only to the extent which corresponds to his own negligences. For passengers the maximum liability is 25,000 gold francs ($5,000).

A liability for delay of passengers, freight and baggage is fixed. These regulations are probably completely new for all countries. Not even the Berne agreement covering railroad passengers and baggage traffic of Oct. 23, 1924, provided such a delay liability for passengers. No responsibility is taken here for the adherence to schedule, the agreement providing only for compensation for delayed delivery of baggage. The Berne agreement covering railroad freight traffic provides for certain delivery terms in place of the delay liability. The new German postal regulations of Jan. 30, 1929, covering postal motor bus services clearly state that a delayed start or arrival or the cancelling of a trip do not give the right to claim compensation. In a similar way the world postal agreements of Aug. 28, 1924, only provide for liability in case of loss, theft or damage. The traffic institutes are considered not so much afraid of the financial disadvantages as of the disputes with their customers.

Since May, 1929, the commission d'études of the International Air Traffic Association has been busy working out new general transportation conditions for air passengers and baggage as well as for air freight service based on the Warsaw agreements and in accordance with the experience of the Berne agreement covering railroad traffic. This work will probably be concluded before the conference of the International Air Traffic Association in Stockholm in March of the current year. It is not known whether the international as-

[*Continued on Page 10*]



U. S. Navy.

An unusual view of a Navy plane just after it has left the deck of the U. S. S. "Saratoga."

The Value of Instruments

AVIATION instruments have played a large part in bringing about the present degree of safety in flying, according to a statement made orally on behalf of the aeronautics research division (Bureau of Standards) of the Aeronautics Branch, Department of Commerce. While little attention was paid to other than engine instruments a few years ago they have become one of the most important aids to the aviator today, it was declared.

It was pointed out that as progress in the designs and manufacture of airplanes has advanced so has the development of instruments. The person who is flying for business, such as the mail pilot, transport operator, and express carrier, is absolutely dependent upon instruments for his safety in the air when out of sight of the ground, as in fog or bad weather, it was said. The aviator who flies for pleasure is not so dependent upon instruments for his security, however, it was explained, for it is nearly always possible for him to turn around and fly back to safety when danger looms.

The pilot who flies in areas affording poor visibility must rely upon his instruments to give him his location, altitude and other information necessary to safe flying, according to the statement, which can not be obtained by looking over the side of the plane.

Uses of Instruments

In pointing out the instruments which are most necessary it was stated that a compass is needed if the ground is visible and a drift meter and altimeter are necessary if flying on experimental work. Engine instruments are also necessary, it was stated. There are several other instruments, though not essential, it was explained. If the pilot is flying in good weather on a lighted airway, instruments other than radio, compass and one or two others are not essentia to safe flying.

A great impetus has been given to the development of instruments by flying in fog or in areas of poor visibility, it was explained. When flying in this sort of weather condition the pilot must have instruments to tell the position of the plane in the air which cannot be known without the use of instruments when the ground cannot be seen, it was added. The other problem in flying in fog is that of landing. This is still in an experimental stage and is being worked out now with the object of providing a landing beam from the ground which will guide the pilot to a landing. In connection with the landing beam, experiments are being carried out to make it possible not only to provide a beam to guide the plane to the ground but also to provide signals which will give the pilot his position over the field and his height above the ground, it was explained. This field of experiment is one in which the greatest developments can be expected in the future, it was asserted.

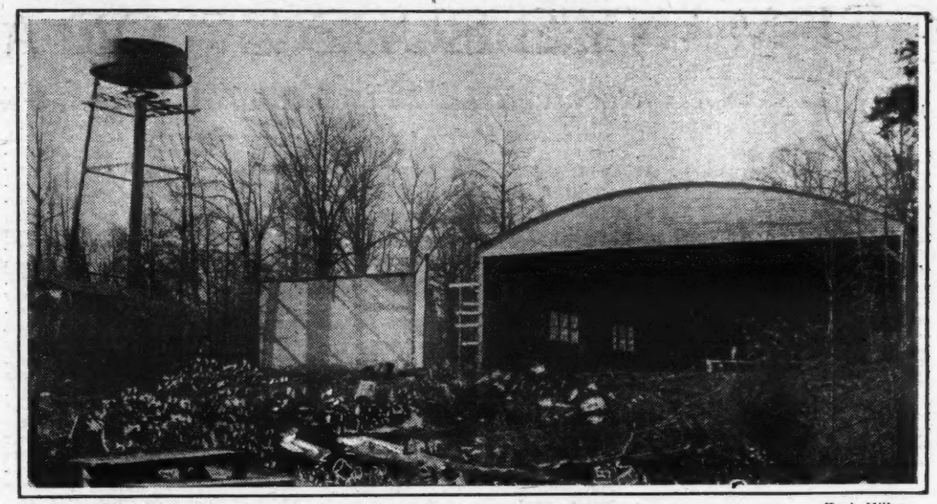
To Maintain Altitude

In order to maintain the proper flying attitude the turn and bank indicator, the rate of climb indicator, which is associated perhaps with the altimeter, are used at present, according to the statement. This combination of instruments has been evolved as the best now available as the result of the experience of many pilots. Further changes can be expected, it was predicted, as a result of the development of instruments now in progress on a sensitive altimeter and artificial horizon of the gyroscope type to supplement other instruments.

Radio is one of the solutions to the problem of landing in fog, but this is being worked out from different angles, it was pointed out. Auxiliary instruments to aid radio would be the altimeter, gyroscopic angle of turn indicator to replace the compass turn indicator which takes too much time to resume its normal position after a turn, it was said.

Czechoslovak Service

ON Apr. 1, 1930, a service between Prague and Rotterdam, via Leipzig and Halle was to begin, according to a report received in the Department of Commerce from Assistant Trade Commissioner Sam E. Woods, Prague, Czechoslovakia. This will be extended to London June 1. Plans call for flights to be made every other day in each direction.



Hugh Miller.

This hangar, being built in a suburban section adjoining Washington, is several miles from the closest airport. When it is completed, obsolete airplanes will be placed in it, after which it will be set afire. All this will be done to enable Government experts and others to determine the ability of water sprinkler systems to control hangar fires. A protective wall is also being built and is shown at the left of the photograph

Parachute Cloth Test Results

CONTRARY to the belief that domestic woven cloths are not suitable materials for parachute construction, tests have shown that many domestic silk cloths are available which are entirely satisfactory and in some respects superior to the foreign products, the National Advisory Committee for Aeronautics stated Mar. 20.

In the tests 36 cloths of domestic manufacture, not previously used in parachute construction, were compared with some silk cloths of foreign manufacture, which have been proved by trial and extended use to be suitable materials for parachute consumption, it was stated. The statement follows in full text:

Although it has been believed that domestic woven cloths are not suitable materials for use in parachutes, tests show that there are many domestic silk cloths available which are entirely satisfactory and in some respects superior to the foreign products.

Specifications Drawn

Based on a comparative study of all the cloths, specifications are drawn for the manufacture of silk parachute cloths, using either the plain or the mock leno weave. These specifications have been accepted by the Navy Department, and service tests on full-sized parachutes made with the domestic woven cloths have demonstrated the suitability of the specified materials. The apparatus and methods employed and the information obtained are being applied in the development of a parachute woven with some home-grown fiber such as cotton.

At the beginning of this investigation it was the consensus of opinion in aeronautical circles that domestic woven cloths were not suitable for parachute construction. All the cloths used were of foreign manufacture. Inasmuch as the life of the aviator may depend on the faultless performance of the parachute, there was naturally a reluctance to depart from established usage in this respect. At the request of the Bureau of Aeronautics, Navy Department, the Bureau of Standards undertook the development of specifications for a silk parachute cloth which could be readily manufactured in this country and would compare favorably with the foreign product in all the requisite properties.

Properties of Silk

As a raw material for the construction of parachute cloths, silk exhibits to a higher degree than other natural fibers all the desirable properties. Its greatest advantage lies in the matter of cost and in the availability of the raw materials. Although several attempts have been made to cultivate the silkworm in this country, the high labor costs involved in handling the cocoon have prevented the rapid advancement of the industry. The methods of measurement used in the tests of the cloths are being applied in the development of a suitable cloth woven from a home-grown fiber, thus obtaining eventually an entirely domestic product. It has been found, for instance, that cotton may be treated to enhance some of the desired qualities.

Federal Survey Of Schools

FOR the purpose of supplying information in answer to a constant flow of inquiries received by the Aeronautics Branch of the Department of Commerce as to the tuition charges and length of time necessary to become a licensed pilot, a survey of all Department of Commerce approved flight instruction schools has been made by the branch.

A statement on the subject, issued by the branch, follows in full text:

On the basis of present returns (about 55 per cent), it appears that the average cost of instruction for the private pilot's course is approximately $565, and the average length of time about 8½ weeks. The average minimum time for the completion of this course is given at 5 2/3 weeks, while the average maximum time is placed at 2 3/5 months.

Reference is made to minimum and maximum time because many conditions enter into the speed or delay with which a student may finish the course. Among these conditions are weather, adaptability of the student to flight instruction, and the availability of the student for classes.

For a limited commercial course, the average cost is $1,255; the average minimum time 2 4/5 months, and the average maximum time 4 3/5 months.

For the transport pilot's course, the average cost is $4,304; the average minimum time is 7 months, and the average maximum time is 11 3/5 months.

The price range for the courses are: Private, $440 to $795; limited commercial, $1,050 to $1,350, and transport $3,075 to $4,550.

While all of the schools adhere to the standard of minimum requirements established by the Department of Commerce, there are many that go above and beyond this standard and obviously their tuition charges are more. For example, there are some phases of flying and some types of ships that are not specified in the regulations which are included in the courses.

The tuition charges given in the foregoing statements do not include room and board, the average cost of which is around $12 per week. The exact amount depends upon the type chosen by the student, the location and the extent to which he wishes to be provided for.

Part-time instruction and plans of prospective students to work their way through are discouraged in general, as the schools emphasize the importance to the student of devoting the full allotted time each day to instruction. Som schools have gone so far as to declare a definite policy against part-time students.

Prospective students also are urged not to undertake a course unless they have enough money available to pay for their entire tuition and living expenses; also there are other institutions that function under a partial payment plan.

None of the schools replying to the questionnaire agreed to furnish employment for their graduates. While no definite stand was taken on this point, it is understood that such assistance, if forthcoming at all, will depend on the qualifications and adaptability of the graduate.

The question of salary the graduate may expect for his first employment after leaving the school also is regarded as being beyond the pale of the schools' activities. The situation in this respect is similar to that of most educational institutions which do not guarantee or promise anything to their graduates in the way of salaries or future employment.

Laws of Indiana On Aeronautics

COMPILATION and printing of the Indiana Aeronautics Laws has just been completed, according to a statement issued by the Secretary of State of Indiana, Otto G. Fifield.

The statement follows in full text:

The pamphlet covers 16 pages and contains every law pertaining to aviation that has been passed by the Indiana Legislature, including: Airports of Cities and Counties, Boards of Aviation Commissioners, Uniform Aeronautics Laws, Licensing of Aircraft and Airmen, Banditry by Aircraft, Theft of Aircraft, Hunting with Aircraft, Transportation of Intoxicating Liquor, Criminal Offenses and the Forfeiture of Property Rights.

The first aeronautics bill was passed in 1920, parts of which were amended in 1921. Additional legislation was passed at each session until these laws are now as modern and up-to-date as those of any State in the Union.

In 1929 the legislature passed an act to provide for the licensing of aircraft and airmen. This act requires all aircraft operating within this State to conform with respect to construction and airworthiness to the standards prescribed by the United States Government and persons engaged in piloting such aircraft must have the qualifications necessary for obtaining and holding the license required by the United States Department of Commerce.

Most of the airplane accidents of the past have been with obsolete, unregistered aircraft and incompetent pilots. This act will materially reduce the number of accidents in this State.

These laws reflect the experience of the past and are necessary in governing the large growth the aeronautics industry has had in the past few years.

Indiana, being the center of population, together with its splendid airports, the new corporation act and modern aeronautics laws makes it an ideal place for the manufacturing of aeroplanes and the aeroplane industry in general and it is predicted that Indiana will soon lead all other States in this field.

These pamphlets may be obtained by applying to the office of the secretary of state, 202 State House, Indianapolis, Ind.

Type of Questions Asked Pilots

THE Aeronautics Branch of the Department of Commerce has compiled 250 questions which indicate the general scope of the required written examinations for the various grades of pilots' licenses, according to the Director of Air Regulation, Gilbert G. Budwig, the Department of Commerce has announced.

In addition to the written examination applicants are required to pass the necessary physical and practical tests, it was said. If an applicant is not able to pass the written examination, even though he has learned to fly under an unlicensed status, he is working under a handicap which may result disastrously, Mr. Budwig stated. The Department's announcement follows in full text:

The General Scope

Two hundred and fifty questions, which indicate the general scope of the required written examinations for the various grades of Department of Commerce pilots' licenses, have been compiled by the Aeronautics Branch, it was announced, by Gilbert G. Budwig, Director of Air Regulation.

"The questions," Mr. Budwig said, "clearly show that the requirements for a Department of Commerce pilot license call for a broad knowledge of the subject of civil aeronautics, including the Air Commerce Regulations, the air traffic rules, airplanes, airplane engines, meteorology and navigation. In addition to the written examination applicants are required to pass the necessary physical and practical flying tests.

"If an applicant cannot pass the written examination, even though he has learned to fly under an unlicensed status, he is, indeed, working under a great handicap which may result disastrously."

Examples of the type of questions which applicants are required to answer to the satisfaction of the examining Department of Commerce inspectors include:

May an unlicensed pilot in an unlicensed ship carry pay passengers from one State to another?

Is it necessary for an airplane bearing an advertisement to be licensed if flown between States?

What is the minimum altitude in flying over a football game?

May acrobatics be performed with passengers for hire?

How do you recover from a tail-spin and how do you tell when a ship is about to spin?

How is the effect of propeller torque counteracted in the rigging of an airplane?

What are the advantages and disadvantages of dihedral in an airplane?

State the possible causes for the following: Nose heaviness, left wing heaviness, excessive vibration?

Name three causes for a loss of oil pressure?

Name four reasons for an air-cooled motor to overheat, the lubrication system functioning perfectly?

Types of Clouds

Name the four basic types of clouds?

What causes bumpy air?

Why is it dangerous to fly close to thunder heads?

Your compass course is 274 degrees, the deviation is 4 degrees west, the variation 3 degrees west. What is your true course?

How would you know if the wind shifted while you were flying a compass course from one town to another?

What method is used to protect the inside of steel tubing in a fuselage against rust?

How do you "track" a propeller?

Define stagger wire, thimble, turtle back, walking beam, routed spar?

What is the rule regarding overtaking aircraft?

What day markings are required on airship mooring cables?

What is the international radio distress signal?

How many coats of dope should be applied to the fabric of a newly covered wing?

What are convection currents?

RADIO AND AVIATION

ONE of the lines of aeronautic radio research work carried on by the Bureau of Standards is the development of a direction finder for use aboard airplanes, according to a statement contained in an air commerce bulletin of the Bureau of Aeronautics of the Department of Commerce. The statement follows in full text:

Such a device is inherently more difficult for the pilot to operate than the radio range beacon aids. It, however, offers a means of navigation for the itenerant airplane or for any aircraft regardless of whether it follows one of the established airways. It thus supplements the department's radio range beacon system. A direction finder of the rotating-coil type is being developed, of maximum simplicity in use, usable either as a homing device or for bearing indications. A model has been constructed and is now under laboratory test, which is expected to fulfill these requirements. Experimental flight tests on this direction finder will begin as soon as it is thoroughly tested in the laboratory.

This direction finder employes two small crossed loop antennas rotating as a unit. An antenna tuning system has been devised permitting a unituning control and proper combinations of the two antenna currents without mechanical switching in the radio-frequency circuits. It operates on the comparison of two signals rather than on zero signal. Hence it permits of specially advantageous operation under conditions of atmospheric or external interference, and when used as a homing device gives a positive indication of the direction of deviation from the course. It also offers an adjustment whereby the course indications may be made as sharp as is desired.

Course indications may be either aural or visual. The aural indications may consist of the comparison of the intensities of two signals, or these signals may be interlocked, giving the same course indications as in the aural radio range beacon system. Visual indication may be obtained by the use of a zero-center deflection instrument. With either type of course indication, bearings may be obtained from any transmitting station within the frequency range of the device. Means are also being worked out whereby a vibrating-reed indicator gives the indications, thereby taking advantage of the freedom from interference inherent in this type of indication.

The research work on this development is actively in progress, and is expected to include flight tests of various types of direction finders.

NOVEL FRENCH PLANE

A COMMERCIAL and transport monoplane has been constructed in France which has two fuselages, three engines, and which can carry a maximum of 28 passengers, according to a statement made Apr. 2 by the National Advisory Committee for Aeronautics. This plane has a cruising speed of 111 miles per hour and a radius of 624 miles, it was stated.

The Dyle and Bacalan "DB 70" has a central body in the form of a very thick wing, to which are attached the wings, fuselage, engine nacelles and landing gear. It is made entirely of duralumin with coverings of sheet duralumin, the fittings being of high-resistance steel. The wing system consists of a thick and deep central section and two wings properly so called.

The Central Body

The central body is a very thick habitable wing and forms an important part of the passenger cabin. The central body has a height of about six feet.

Each wing is attached to the central body and is supported in the middle by a hinged strut, the lower end of which is attached to the lower part of the central body.

The presence of two fuselages enables the use of a horizontal empennage of large aspect ratio. The stabilizer is adjustable and the elevator is balanced. Each fuselage carries a vertical empennage consisting of a fin and a balanced rudder.

The landing gear has two pairs of wheels, one pair under the outer edge of each fuselage. It has a track gauge of 22 feet without continuous axle. The wheels are provided with brakes.

The "DB 70" is equipped with three 600-horsepower Hispano-Suiza engines with reduction gears and tractor propellors. The engines are mounted forward of the central body so as to diminish the interference between the central body and the propellors. The gasoline tanks are placed in the wings. Each engine is absolutely separated from the cabin by a fire wall and by another wall designed to absorb the noise.

Space for Passengers

The space reserved for the passengers consists of two lateral cabins connected by a central salon. On day flights 28 passengers can be carried, and 24 on night flights. By a simple device the chairs are converted into two tiers of beds. There is also a kitchen.

The maximum speed near the ground is 124 miles per hour, and the cruising speed 111 miles per hour. It has a radius of 621 miles, and can stay in the air for five and one-half hours of normal flight.

Meeting's Review

[*Continued from Page 7*]

accordance with the provisions set forth in the preceding paragraph.

VI. Whereas there is now pending in Congress a bill (H. R. 9500) known as the Watres bill, providing for the change of payment for carrying air mail from the poundage basis to a basis of rental of definite spaces, as the railroads are now paid, per mile; and

Whereas in view of the explanation of this measure by the Post Office Department in testimony before the Post Roads Committee of Congress it appears that its purpose and effect will be to equalize payment for carrying mails between all operators and that it will give many more cities the advantage of air mail and will encourage and stabilize passenger service; and

Whereas no operator has opposed this measure but representatives of almost all the principal lines appeared before the Committee and urged the bill's passage,

Be it further resolved, That a copy of this resolution be sent to Members of Congress.

Be it further esolved, That a copy of this resolution be sent to Members of Congress.

VII. Resolved, That this conference recommend legislation by each State requiring—

1. Federal license for all aircraft and airmen in the State, and

2. Suitable regulations requiring all aircraft to be operated in accordance with the air traffic rules and regulations of the United States Department of Commerce.

About Liability

(*Continued from Page 8.*)

sociation will then apply these new transportation conditions to international air transportation as described in the Warsaw agreement, or to both international and intranational air transportation. An extension of this kind appears to be desirable in the interest of aimplification of transportation conditions. In this case it will be possible to omit only the regulations concerning delay liability.

In so far as the combination of air-rail service, known in Germany as "Fleiverkehr," is concerned, the regulations of the agreement will apply only to that part of the transportation which is actually carried out by airplanes. For the rest the airway and railroad operators are free to acknowledge the regulations of this agreement either for the entire traffic or only for a certain portion of it. (A. Douglas Cook, assistant trade commissioner, Berlin, Germany, Feb. 19, 1930.)

Study of Metals In Aircraft

ALUMINUM-COATED duralumin has been found to have marked superiority over plain duralumin for severe service, searching tests by the Bureau of Standards, Department of Commerce, in cooperation with various governmental agencies interested in aircraft, reveal. Full text of a statement on this subject, issued by the Bureau, follows:

It is well established that under some conditions a corrosive attack on metal may be hastened considerably if the metal is strained while it is being corroded. One of the most important cases in which the behavior of a metal under the combined action of stress and corrosion should be considered is in aircraft service. The high-strength aluminum alloy, commonly known as "duralumin," which is one of the most important materials for aircraft construction, has been found under some service conditions to become weak and brittle. As a result of the extensive study carried out at the Bureau of Standards, the reasons for this undesirable behavior have been greatly clarified.

Effect of Corrosion

As part of this study, the effect upon the tensile properties of sheet duralumin of subjecting the material simultaneously to corrosive influences and to stress has received attention. The specimens were corroded in salt water by an alternate immersion or "wet-and-dry" method while stressed in static tension or while being repeatedly bent back and forth by means of a device which has been appropriately dubbed a "wiggle machine." The corrosive attack on plain duralumin sheet was found to be increased by static tension, although the increase over the attack on comparison unstressed material was not sufficient to cause any great anxiety if the service conditions are mild enough to warrant consideration of the use of the plain duralumin. The attack on aluminum-coated duralumin sheet, however, was found to be entirely negligible even with severely corrosive conditions.

A Searching Test

Corrosion accompanied by repeated bending stresses was found to constitute a very searching test. Even here, however, the behavior of the aluminum-coated duralumin was so much better than that of the plain duralumin as to leave no uncertainty as to the superiority of this type of material for purposes where high strength, lightness, and corrosion-resistance are required.

Policy of France On Aviation

TWO of the largest French manufacturers of airplanes and seaplanes are now members of the Societe Generale Aeronautique, the first association of French aviation companies created in accordance with the desire of the ministry of air to centralize the industry, according to a report received Mar. 29 in the Department of Commerce from W. L. Finger, automotive trade commissioner to Europe.

Text of a statement issued by the Department concerning the report proceeds:

While the ministry of air, it is reported, believes that such a policy will improve the quality of the material, facilitate more effective experimental work, enable manufacturers to produce at lower costs, and will encourage aviation exports, it sees a danger in too great a centralization of the actual plants. The majority of airplane manufacturing concerns are located near Paris. The air ministry would welcome a certain degree of spreading of the industry over the country.

The companies included in the Societe Generale Aeronautique retain their individual identities, but the controlling company has full jurisdiction in questions of finance and broad policy.

FRANCE PROMOTES AERIAL SAFETY

[Continued from Page 3]

stability. The ministry of air also contemplates tests of slotted-wing machines, having been impressed by their performance in the Guggenheim safe-aircraft competition.

Study is also being devoted to the question of variable-wing surface, to flat spins, and to the risk of breakage or collapse of the plane at exceptionally high speeds.

(3) Motor trouble gives rise to two kinds of risks—forced landings and fire. The French service of aerial safety seeks to diminish the danger of forced landings through the realization of a greater degree of reliability and regularity of motor performance resulting from the use of better material, of more simple design, and of a greater degree of accessibility to those parts particularly liable to give trouble.

In addition the government is attempting to reduce the liability of forced landings by favoring in its construction program multi-motored planes capable of continuing their flight with a full load after one motor has stopped functioning.

Result of Tests

Tests having shown that the chief cause of fire is back fire, the ministry of air arranged for the creation of antiback-fire appartus, to prevent flames from going back from the cylinder to the carburetor. Such apparatus is being installed on many of the planes already in use and is prescribed equipment for all new motors.

To reduce the risk of fire resulting from fuel leakage, the Comité Francaise de Propagande Aéronautique organized, in conjunction with the ministry of air, a contest as a result of which several types of joints and fittings were presented which seem superior to those formerly in use.

The same committee and the ministry of air arranged another contest intended to develop a heavy fuel oil and carburetors and motors which would use such fuel. It is expected that this contest, the results of which are not known yet, will present some interesting and useful findings.

To prevent fire while the plane is on the ground, the government is encouraging manufacturers to produce a fireproof muffler, of such a nature that gas or other inflammable material will not catch fire when it comes in contact with the muffler, and the efforts put forth in this direction give reason to hope for success.

The Central Service

The central service of aerial safety believes that all these fire preventive measures are only temporary and that the real permanent solution will be found in the adoption of heavy-oil motors with direct fuel injection and compression ignition. To this end, M. Clerget, of the service technique of the ministry of air, has made considerable progress with a Diesel engine, which has proved itself capable of flying a plane, and he is still working to improve the motor.

Finally, experiments are being conducted to improve the efficiency of the fire extinguishers carried on planes.

(4) Realizing that fog is one of the greatest obstacles to air navigation, the French government has undertaken many experiments with the hope of dissipating the fog, or of enabling pilots to see through it for a certain distance. Thus far these experiments have yielded very few encouraging results, but they are being continued.

Of more immediate interest is the increasing attention given to blind flying, which will become a regular part of the instruction of all pilots, civil and military. A system of piloting planes by radio has been used with a certain amount of success on the Paris-London line.

Also Mr. Loth has obtained unusually promising results from experiments in tracing an air route and outlining air fields by means of radio-beacons, enabling a pilot to follow any given course and to land at an indicated airdrome solely through following the indications of the radio-beacons.

Other measures to make the conditions in the air more safe include improvement in the weather reporting service; the clear indication by special lights of towers or other obstacles near flying fields; special glasses for pilots provided with lenses which eliminate certain fatiguing rays of light and which will diminish the risk of dizziness; study designed to simplify and improve parachutes.

The ministry of air reckons that the safety measures which have already been applied will result in an annual saving of about 40 lives and of over 30,000,000 francs—about $1,200,000—in material, through reductions in accidents. It further reckons that when the complete safety program which has been laid out becomes operative the degree of safety in air navigation will be increased by about 75 per cent and that in a few years, when all the material now in use will have been replaced by planes constructed in accordance with the policies of the central service of aerial security, there will be an annual saving in material of over 150,000,000 francs—about $6,000,000—through elimination of accidents.

The French ministry of air believes that the greatest progress toward aerial safety can be realized through international cooperation. Consequently it has been arranged for the French foreign office to suggest to the various interested nations that an international center for aerial security be formed, this center to effect an international exchange of inventions, information, and results of tests bearing on safety in air navigation. With the same idea in view, the French ministry of air, in collaboration with the Comité Francais de Propagande Aéronautique, has called an international congress of aerial safety which will meet in Paris in November, this year.

TELLING THE PILOT

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conditions, mentioning by name the airports at which landings cannot be made with safety and designating the alternate safe landing fields in the terminal area. Should all airports at a terminal location be closed, the Weather Bureau will ascertain and report conditions at the nearest landing fields at which safe landings can be made. The local weather bureau is the clearing house for this airport and landing-field weather service at terminals.

Report Conditions

Along the route where weather data cannot be furnished on a cooperative basis the airway keepers in charge of the beacons and intermediate landing fields serve as weather reporters. A watch house is usually installed adjacent to the field to house the teletype machines and furnish quarters for the airway keepers. The watch houses are fitted out with sleeping quarters and cooking paraphernalia in order that the keepers may stay at the field during inclement weather and provide for their meals and comfort during the unoccupied time when on watch. Two airway keepers are usually employed under civil service to care for the landing field and render weather reports. At isolated locations quarters are provided for the airway keepers, and the teletype machines are installed in the keepers' quarters.

There are times when private weather reports are furnished by air-transport operators or others for the use of their pilots in the air. These reports must be cleared through the local United States Weather Bureau and broadcast under its authority in order that there may be no liability involved should an accident occur where the weather may be considered the contributing factor.

The pony teletype circuit is usually provided at terminals for the purpose of distributing messages between the Weather Bureau, radio stations, airports, and air-transport companies' offices. Any transport company or airport may secure a drop on the pony teletype circuit by making arrangements with the Department of Commerce and the American Telephone & Telegraph Co., the payment for the sending and receiving teletype machines being made by the subscribers. Receiving machines may also be subscribed for on the long line teletype circuit by airports or air-transport operators at intermediate points.

Additional Service

In addition to the collection of weather information, the teletype circuit is used to disseminate the secondary net covering the off airways weather data every three hours and available upper-air data between the Weather Bureau, transport operators, and the principal intermediate landing fields along the route. The long line teletype circuit is also made available to the Weather Bureau for the exchange of signals used for making up weather maps. The communication time made available to the Weather Bureau is coordinated with the more important communications on the teletype circuit and arranged on a basis of 5-minute periods.

The point-to-point communications between the radio stations are handled over the teletype circuit. These messages cover departures, arrivals, and position reports of aircraft. The position reports are placed on the teletype by the airway keepers at the principal reporting points along the route when the airplane passes over. Each station on the teletype circuit has an assigned call bell by which messages intended for any one station can be identified and acknowledged without delay. The instantaneous communications system provided by teletype is essential for aeronautical communications where a fast system of transportation requires even a faster system of communications.

The further extension of teletype communications and the broadcast of hourly weather information for the use of pilots flying over the national airway system is a great forward step in the elimination of weather hazards and increasing the safety of air transportation.

Growing Interest In Aviation

THE number of inquiries for aeronautical information of a general character received by the Aeronautics Branch of the Department of Commerce during February was greater than the total recorded for any month in the past year, according to a statement issued by the branch. The full text of the statement follows:

More than 5,600 inquiries for various types of aeronautic information were received during that month. In only one other month of last year did the number of inquiries reach or pass the 5,000 mark. That month was October, 1929, when the number mounted to 5,042. The remaining months of the year's period were in the 4,000 figure with the exception of February and June when the inquiries dropped into the 3,000 category.

Nearly 51,000 copies of the various printed publications of the Aeronautics Branch were furnished the public free of charge during the month of February. The publications cover all of the activities of the Aeronautics Branch and other subjects designed to promote air commerce. In addition, 548 personal letters setting forth answers to questions that were not embodied in the official bulletins were written.

The 548 inquiries answered by letter were divided into the following classes: Information of a general and statistical character on scheduled air transportation; general and statistical information about the aeronautical industry; aeronautic education and historical subjects; the activities of the Aeronautics Branch; and general information on such subjects as blind flying, air-line distances, and passports.

In addition to these 548 inquiries, there were 230 letters received requesting information on subjects outside of the scope of the activities of the Aeronautics Branch, which were referred to offices other than the Department of Commerce after personal letters from the aeronautic information division had gone out to the persons involved explaining the action taken on their requests.

The requests handled by the aeronautic information division were in addition to several thousand specific services sought of other divisions in the Aeronautics Branch on the particular subjects handled by those organizations.

A Peace-Time "Warfare"

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rious foreign countries, and officers from other branches of the Army.

The various group organizations, which will make up the provisional wing, began their westward journey last week. The First Pursuit Group, commanded by Maj. Ralph Royce, left its station at Selfridge Field, Mich., early this week; the Second Bombardment Group, commanded by Maj. Hugh Knerr, has taken off from Langley Field, Va.; and the Third Attack Group, commanded by Maj. Devenport Johnson, was winging its way west from Fort Crockett. The Seventh Bombardment Group, commanded by Maj. Carl Spatz, was to leave Rockwell Field for Sacramento. The Ninety-first Observation Squadron is at Mather Field, where it, since Mar. 7, has been making final preparations for putting the airdrome in shape pending arrival of the various units. The Observation Squadron is commanded by Capt. Walter Kraus.

I am looking forward to the maneuvers with much interest, because they will put to a practical test many of the new tactical theories developed during the past year, as well as new equipment, some of which is still in the experimental stage.

Inasmuch as the field exercises will be carried on over a territory of more than 20,000 square miles and under all sorts of topographical conditions, they will not alone furnish Air Corps pilots valuable experience as well as present an unusual opportunity for tactical studies of great importance, but also afford the general public an exceptional occasion to follow the battle progress of an air force of nearly 150 fighting planes. These ships will come from all sections of the country and will travel a total distance of nearly 30,000 miles in going from and returning to their proper stations. A general idea of the amount of flying to be done in course of the mimic battles may be gleaned from the fact that about 1,000,000 plane miles are scheduled to be flown from the Sacramento base.

In addition to the field exercises special demonstrations will be staged by the provisional wing at San Francisco on Apr. 19 and at Los Angeles on Apr. 26. The ships will arrive in each of the two cities about 11 o'clock in the morning, pass in review, stage miniature air battles and lay down smoke-screen. At night bombing formations will pass over the two cities and drop parachute flares to simulate bombs.

Revised Schedule On East Coast

INAUGURATION of a new flying schedule over the air mail route between New York City and Atlanta, Ga., and so timed as to connect with the international air mail service over the Pan-American Airways System, from Miami to Pan-American countries, was announced orally by the Post Office Department.

The new schedule embraces Charlotte, N. C., for the first time. The new schedule as revised calls for the following changes in the old schedule over the Atlanta-New York City route:

Southbound.	Northbound.
3:00 p. m.	9:30 a. m.
3:55 p. m.	8:40 a. m.
5:15 p. m.	7:20 a. m.
6:25 p. m.	6:15
8:25 p. m.	4:10 a. m.
9:20 p. m.	
10:10 p. m.	2:35 a. m.
11:55 p. m.	12:45 a. m.

The schedule will be maintained daily, due to the expansion of the service as a result of heavy increases in the amount of air mail handled along the Atlantic seaboard. The schedule has also been arranged to connect with the transcontinental air mail service out of New York City so as to complete deliveries of air mail in the Middle West the following morning, it was stated.

Montreal Exhibition

THE Montreal Aircraft Exhibition, held annually under the auspices of the Montreal Light Aeroplane Club, will take place this year from Apr. 19 to 26, inclusive, at the "Stahall." The new British dirigible R-100 is expected to be moored at the St. Hubert airport mast during the week of the show. (L. A. France, Assistant Trade Commissioner, Montreal.)

You Can't Fly With One Wing

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